APPENDIX I: MITIGATION STRATEGIES

This appendix summarizes additional activities and resources provided to plan participants to support the update of the mitigation strategy.

2021 GOALS AND OBJECTIVES REVIEW

Sussex County's planning documents and recent policies changes were reviewed and discussed with the Planning Team to help inform the review and update of the goals and objectives. Table I-1 and Table I-2 summarize the goals and objectives for the 2025 HMP update, respectively.

Table I-1. 2025 Goals

Goal Number	2025 Goals
1	Protect Life
2	Protect Property
3	Increase public preparedness and awareness
4	Develop and maintain an understanding of increased risk from climate change impacts to natural hazards
5	Enhance mitigation capabilities to reduce hazard vulnerabilities
6	Support continuity of operations pre-, during, and post-hazard events
7	Reduce the risk of natural hazards for socially vulnerable populations
8	Address long-term vulnerabilities from high hazard dams

Table I-2. 2025 Objectives

Objective Number	2025 Objectives
1	Develop, enhance, and protect early warning and emergency communications systems.
2	Improve and support Comprehensive Regional Evacuation Plan.
3	Strengthen County and local planning, building codes, ordinances, and enforcement.
4	Identify the need for, and acquire, any special emergency services, training, and equipment to enhance response capabilities for specific hazards.
5	Enhance sheltering capabilities at the local level.
6	Protect, maintain, and increase resilience of infrastructure and critical facilities.
7	Reduce repetitive and severe repetitive losses.
8	Assure coordination between communities and encourage shared services in acquiring, maintaining and providing emergency services.
9	Reduce the risk of utility failure.
10	Review existing local laws and ordinances, safety inspection procedures, and applicable rules to help ensure that they employ the most recent and generally accepted standards for the protection of buildings and environmental resources.
11	Identify and pursue funding opportunities to develop and implement local and county mitigation activities.
12	Provide/Improve flood protection with flood control structures, and drainage maintenance plans.

Objective Number	2025 Objectives
13	Enhance stakeholder education and training about hazard risks and mitigation.
14	Review and incorporate updated hazard data into the County Hazard Mitigation Plan and other county and local planning mechanisms.
15	Increase support for the development of local mitigation planning and projects that provide co-benefits and support a healthy and equitable environment.
16	Better characterize flood/stormwater hazard events by conducting additional hazard studies and identify inadequate stormwater facilities and poorly drained areas.
17	Prevent (or discourage) new development in hazardous areas or ensure that if building occurs in high-risk areas that it is done in such a way as to minimize risk.
18	Strengthen understanding of, and adaptation to, a changing climate.
19	Encourage the use of green and natural infrastructure.
20	Coordinate with local, County, state, federal, international, and other stakeholder agencies to maintain natural systems, including wetlands, parks, and riverine and coastal areas.
21	Ensure continuity of government operations, emergency services and essential facilities during and immediately after disaster and hazard events.
22	Increase resiliency by facilitating rapid disaster recovery.
23	Support and encourage the implementation of alternative energy source.
24	Implement mitigation measures that promote the reliability of lifeline systems.
25	Promote sustainable and equitable land development practices that direct future development away from vulnerable areas.
26	Encourage and support multi-jurisdictional mitigation projects that leverage funding and support from multiple levels of government and community organizations.
27	Encourage the establishment of policies to help ensure the prioritization and implementation of mitigation actions and/or projects designed to benefit socially vulnerable populations and underserved communities.
28	Ensure that dam infrastructure is maintained
29	Support the identification and access to funding to repair, rehabilitate, or replace dams

MITIGATION STRATEGY WORKSHOP RESOURCES

On May 8, 2024, a Mitigation Strategy Workshop was held for all plan participants. The workshop was held in-person at the Sussex County Emergency Operations Center (135 Morris Turnpike, Newton, NJ 07860) and was led by the contract consultant. Following the meeting, participating jurisdictions had the opportunity to work in-person with the contracting consultant. Furthermore, this meeting was supplemented by emails and phone calls between Sussex County and the contract consultant, for all participants to support the development of focused problem statements based on the impacts of natural hazards in the county and their communities. These problem statements were intended to provide a detailed description of the problem area, including its impacts to the jurisdiction; past damages; loss of service; etc. An effort was made to include the street address of the property/project location, adjacent streets, water bodies, and well-known structures as well as a brief description of existing conditions (topography, terrain, hydrology) of the site. These problem statements formed a bridge between the hazard risk assessment which quantifies impacts to each community with the development of actionable mitigation strategies. Resources available at the workshop and follow up discussions included the following to assist with the identification of mitigation alternatives and the development of the mitigation strategy workshops found in Section 9 (Annexes).

1. FEMA Local Mitigation Handbook
2. Public Survey Results
3. FEMA Mitigation Action Types (Table I-3)
4. FEMA Mitigation Ideas
5. FEMA Project Useful Life Factsheet
6. Mitigation Funding Sources at the Federal, State, and Local levels (Table I-4)
7. FEMA Region 2 Funding Sources for New Jersey
8. FEMA Ecosystem Services
9. Mitigation Catalog

Types of Mitigation Actions

A mitigation action is a specific action, project, activity, or process taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals. The actions to reduce vulnerability to threats and hazards form the core of the plan and are a key outcome of the planning process.

The primary types of mitigation actions to reduce long-term vulnerability are:

- Local Plans and Regulations (LPR)
- Structure and Infrastructure Projects (SIP)
- Natural Systems Protection (NSP)
- Education and Awareness Programs (EAP)

Table I-3. FEMA Mitigation Action Types

Mitigation Type	Description	Examples
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	• Comprehensive plans • Land use ordinances • Subdivision regulations • Development review • Building codes and enforcement • NFIP Community Rating System • Capital improvement programs • Open space preservation • Stormwater management regulations and master plans
Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program.	• Acquisitions and elevations of structures in flood prone areas • Utility undergrounding • Structural retrofits • Floodwalls and retaining walls • Detention and retention structures • Culverts • Safe rooms

Mitigation Type	Description	Examples
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	• Sediment and erosion control • Stream corridor restoration • Forest management • Conservation easements • Wetland restoration and preservation
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	• Radio or television spots • Websites with maps and information • Real estate disclosure • Presentations to school groups or neighborhood organizations • Mailings to residents in hazard-prone areas • StormReady • Firewise Communities

1.1.1 Potential Mitigation Funding Sources

While it is important to recognize the mitigation strategies for Sussex County to help achieve the mitigation goals and objectives of the HMP, it is also important to provide sources for funding to implement these strategies. The table below provides a list of programs, descriptions, and links for those seeking funding sources. Please note that this table is not intended to be a comprehensive list, but rather a starting point to help identify potential sources of funding for the identified mitigation strategies.

Table I-4. New Jersey Mitigation Funding Sources

Program	Description	Lead Agency	Website
Federal			
Hazard Mitigation Assistance (HMA)	Grants to provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages – includes FMA, HMGP, PDM	FEMA	https://www.fema.gov/hazard-mitigation-assistance
Flood Mitigation Assistance (FMA)	Program Grants to States and communities for pre-disaster mitigation planning and projects to help reduce or eliminate the long-term risk of flood damage to structures insurable under the National Flood Insurance Program	FEMA	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program (HMGP)	Grants to States and communities for planning and projects providing long-term hazard mitigation measures following a major disaster declaration	FEMA	https://www.fema.gov/hazard-mitigation-grant-program
Building Resilient Infrastructure and Communities (BRIC)	Supports states, local communities, tribes and territories to undertake hazard mitigation projects by reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program.	FEMA	https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
Public Assistance: Hazard Mitigation Funding Under Section 406	Hazard mitigation discretionary funding available under Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act following a Presidentially declared disaster	FEMA	https://www.fema.gov/press-release/20220328/fema-hazard-mitigation-grants-404-and-406

Program	Description	Lead Agency	Website
Assistance to Firefighters Grant Program	The primary goal of the Assistance to Firefighters Grants (AFG) is to enhance the safety of the public and firefighters with respect to fire-related hazards by providing direct financial assistance to eligible fire departments, nonaffiliated Emergency Medical Services organizations, and State Fire Training Academies. This funding is for critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience.	FEMA	https://www.fema.gov/welcome-assistance-firefighters-grant-program
High Hazard Potential Dams (HHPD) Rehabilitation Grant	The Rehabilitation of High Hazard Potential Dams Grant Program (HHPD provides technical, planning, design, and construction assistance in the form of grants to non-Federal governmental organizations or nonprofit organizations for rehabilitation of eligible high hazard potential dams.	FEMA	https://www.grants.gov/web/grants/view-opportunity.html?oppId=316238
Fire Management Assistance Grant Program	Assistance for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster. Provides a 75% Federal cost share and the State pay the remaining 25% for actual cost.	FEMA	https://www.fema.gov/fire-management-assistance-grant-program
Disaster Housing Program	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage, and rental assistance	HUD	https://www.hud.gov/program_offices/public_indian_housing/publications/dhap
HOME Investment Partnerships Program	Grants to local and state government and consortia for permanent and transitional housing, (including financial support for property acquisition and rehabilitation for low-income persons)	HUD	https://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/
HUD Disaster Recovery Assistance	Grants to fund gaps in available recovery assistance after disasters (including mitigation)	HUD	https://www.hud.gov/info/disasterresources
Section 108 Loan Guarantee	Enables states and local governments participating in the Community Development Block Grant (CDBG) program to obtain federally guaranteed loans for disaster-distressed areas	HUD	https://www.hudexchange.info/programs/section-108/
Smart Growth Implementation Assistance (SGIA) program	The SGIA program focuses on complex or cutting-edge issues, such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under 4 categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design or medical and social service facilities siting.	EPA	https://www.epa.gov/smartgrowth

Program	Description	Lead Agency	Website
Partners for Fish and Wildlife	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats	U.S. Fish and Wildlife Service	https://www.fws.gov/partners/
FHWA Emergency Relief Program	Fund for the repair or reconstruction of Federal-aid highways that have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause	U.S. Department of Transportation (DOT)	https://www.fhwa.dot.gov/programadmin/erelief.cfm
Transportation Investment Generating Economic Recovery (TIGER)	Investing in critical road, rail, transit, and port projects across the nation	U.S. DOT	https://www.transportation.gov/tags/tiger-grants
Community Facilities Direct Loan & Grant Program	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial, or business undertakings.	USDA	https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program
Emergency Loan Program	USDA's Farm Service Agency (FSA) provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters, or quarantine	USDA	https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/index
Emergency Watershed Protection (EWP) Program	Provide assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
Financial Assistance	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land	NRCS	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/
Emergency Management Performance Grants (EMPG) Program	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities	FEMA, U.S. DHS	https://www.fema.gov/emergency-management-performance-grant-program
Reimbursement for Firefighting on Federal Property	Provides reimbursement only for direct costs and losses over and above normal operating costs.	U.S. DHS	https://www.usfa.fema.gov/grants/firefighting_federal_property.html

Program	Description	Lead Agency	Website
Department of Homeland Security Grant Program (HSGP)	HSGP is composed of three interconnected grant programs including the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Operation Stonegarden (OPSG). Together, these competitive grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration.	U.S. DHS	https://www.dhs.gov/homeland-security-grant-program-hsgp
Land & Water Conservation Fund	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies)	National Park Service	https://www.nps.gov/subjects/lwcf/index.htm
Land and Water Conservation Fund	Funding to states, local and conservation organizations for outdoor recreational development, renovation, land acquisition, and planning.	U.S. Department of the Interior	https://www.doi.gov/lwcf
USSBA	Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.	Small Business Administration (SBA)	https://www.sba.gov/funding-programs/disaster-assistance
State			
New Jersey Clean Energy Program (NJCEP)	NJCEP promotes increased energy efficiency and the use of clean, renewable sources of energy, including solar, wind, geothermal, and sustainable biomass. The results for New Jersey are a stronger economy, less pollution, lower costs, and reduced demand for electricity. NJCEP offers financial incentives, programs, and services for residential, commercial, and municipal customers. Refer to https://www.njcleanenergy.com/main/about-njcep/about-njcep for additional details on NJCEP. The program also offers a Community Energy Plan Grant for government entities (e.g., municipality, county, Green Team or environmental commission, or other Sustainable Jersey organization within a community or county). The grant will provide funding for an entity to create a Community Energy Master Plan to align local communities with the State Energy Master Plan.	New Jersey Board of Public Utilities	https://www.njcleanenergy.com/main/about-njcep/about-njcep

Program	Description	Lead Agency	Website
NJDEP Grant and Loan Programs	NJDEP offers a wide variety of funding opportunities for local governments and other types of organizations to fund numerous environmentally based projects involving mitigation of hazards such as flooding and wildfires. This includes funding for: air quality, energy, and sustainability; compliance and enforcement; engineering and construction; land use management; local government assistance; natural and historic resources; site remediation and waste management programs; and water resource management. Information on each of the programs can be found on the NJDEP website: https://www.nj.gov/dep/grantandloanprograms/.	NJDEP	https://dep.nj.gov/grantandloanprograms/
Green Acres Program	Together with public and private partners, Green Acres has protected well over a million and a half acres of open space and provided hundreds of outdoor recreational facilities in communities around the State. Green Acres provides low interest (2 percent) loans and grants to municipal and county governments to acquire open space and develop outdoor recreation facilities. Green Acres also provides matching grants to nonprofit organizations to acquire land for public recreation and conservation purposes. Over the years, voters have authorized $3.3 billion in Green Acres funding, approving every bond referendum put before them.	NJDEP	https://dep.nj.gov/greenacres/
Blue Acres Program	The Blue Acres Program purchases flood-prone properties. This land preservation program assists local government units and nonprofits in their efforts to increase and preserve permanent outdoor recreation areas for public use and enjoyment, and conservation areas for the protection of natural resources such as waterways, wildlife habitat, wetlands, forests, and view sheds. A secondary benefit of these laws and rules is that flood-prone properties are often purchased and not available for future development. Funding for Blue Acres is a combination of dedicated state funding from the cooperate business tax and federal grants. To date, the program has received five state funding appropriations from 2009-2019, ranging from $3 million to $12 million to effectuate buyouts in flood-prone areas. Most recently, the 3 Garden State Preservation Trust appropriation recommendation proposed Blue Acres receive an infusion of $10.5 million ($10 million for buyouts and $500,000 for administrative costs).	NJDEP	https://dep.nj.gov/blueacres/

Program	Description	Lead Agency	Website
Open Space and Farmland Preservation Programs	Farmland and open space preservation programs are often funded partially through grants administered by the NJ State Agriculture Development Committee and the New Jersey Green Acres Program. The objective of these programs is to expand the existing county and municipal park systems. Many counties in New Jersey also support land preservation acquisition through open space funding.	Counties, NJ State Agriculture Development Committee, and the New Jersey Green Acres Program	https://www.nj.gov/agriculture/sadc/farmpreserve/
New Jersey Water Bank (NJWB)	NJWB is a partnership between the NJDEP and the New Jersey Environmental Infrastructure Trust (NJEIT) to provide low-cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water. The NJWB finances projects by utilizing two funding sources. The Trust issues revenue bonds which are used in combination with zero percent interest funds to provide very low-interest loans for water infrastructure improvements. The NJDEP administers a combination of Federal State Revolving Fund capitalization grants, as well as the State's matching funds, loan repayments, State appropriations, and interest earned on such funds.	NJDEP, NJEIT	https://dep.nj.gov/wiip/njwb-process/about-us/
NJDEP Dam Restoration and Inland Water Projects Loan Program	The New Jersey Dam Restoration and Inland Water Projects Loan Program was established by the “Green Acres, Clean Water, Farmland and Historic Preservation Bond Act of 1992”, P.L. 1992, c. 88. The purpose is to provide loans to dam owners for dam restoration or inland waters projects.	NJDEP Dam Safety Program	https://dep.nj.gov/grantandloanprograms/dam-restoration-inland-water-projects-loan-program/
Dam Restoration Loan Program	The New Jersey Dam Restoration Loan Program was established by the “Dam, Lake, Stream, Flood Control, Water Resources and Wastewater Treatment Project Bond Act of 2003”, P.L. 2003, c. 162. The purpose is to provide loans to dam owners for dam restoration projects.	NJDEP Dam Safety Program	https://dep.nj.gov/wlm/drec/dam-safety/dam-restoration-loan-program/
New Jersey Redevelopment Authority (NJRA)	NJRA is an independent state financing authority committed exclusively to the redevelopment of New Jersey’s urban areas. NJRA offers several financing resources, including site acquisition funding, predevelopment assistance, several development assistance resources, and technical assistance.	NJRA	https://www.njra.us/project-financing

Program	Description	Lead Agency	Website
New Jersey Department of Community Affairs	The New Jersey Department of Community Affairs (NJDCA) is a state agency created to provide administrative guidance, financial support, and technical assistance to local governments, community development organizations, businesses, and individuals to improve the quality of life in New Jersey. NJDCA offers a wide range of programs, funding, and services that respond to issues of public concern, including fire and building safety, housing production, community planning and development, and local government management and finance. Among other funding sources, NJDCA administers CDBG funding and is typically the CDBG-Disaster Relief funding recipient for the State of New Jersey.	NJDCA	https://nj.gov/dca/dhcr/grants/index.shtml
New Jersey Board of Public Utilities (BPU)	The New Jersey BPU works with private utility companies to provide analysis of natural hazard information affecting the provision of electric power, telecommunications, public water, sewage collection and treatment, and other regulated public utilities. The data are used during response and recovery efforts in the event of emergency or disaster and is also used to analyze impact of mitigation plans and projects. BPU also provides technical assistance for the Energy Resiliency Program	BPU	https://www.nj.gov/bpu/home/grants.html
Environmental Infrastructure Financing Program	Qualified borrowers receive loans in two equal parts: Approximately one half to three quarters comes from a 0-percent interest State Revolving Fund maintained by the NJDEP. The other portion comes from proceeds of highly rated tax-exempt revenue bonds sold by the Trust. Combining these two funds results in a loan that is 50 to 75 percent lower than traditional loan rates.	NJDEP	https://dep.nj.gov/wp-content/uploads/wiip/docs/iup-archives/cwf_overview.pdf#:~:text=It%20was%20created%20by%20the%20legislature%20to%20provide,acquisition%20and%20remedial%20action%20activities%20like%20brownfields%20restoration.
New Jersey Small Cities Communities Development Block Grants	The New Jersey Small Cities Communities Development Block Grants provide funds for economic development, housing rehabilitation, community revitalization, and public facilities designated to benefit people with low and moderate incomes or to address recent local needs for which no other source of funding is available to non-entitlement counties and municipalities. Information on the program is available on the website: https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html.	NJDCA	https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html

Program	Description	Lead Agency	Website
New Jersey Conservation Foundation (NJCF)	NJCF is a private, not-for-profit organization. Through acquisition and stewardship, NJCF protects strategic lands, promotes strong land use policies, and forges partnerships to achieve conservation goals. Grants are used to help fund preservation activities. Information on the program is available on the website: https://www.njconservation.org/what-we-do/.	NJCF	https://www.njconservation.org/what-we-do/
The New Jersey Infrastructure Bank	The New Jersey Infrastructure Bank is an independent State Financing Authority responsible for providing and administering low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Two programs provide and administer low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Approximately $350 million is awarded annually. 1. NJEIT for the purpose of financing water quality infrastructure projects that enhance ground and surface water resources, ensure the safety of drinking water supplies, protect the public health, and make possible responsible and sustainable economic development. 2. The New Jersey Transportation Infrastructure Bank (NJTIB) is an independent State Financing Authority responsible for providing and administering low interest rate loans to qualified municipalities, counties, and regional authorities in New Jersey for the purpose of financing transportation quality infrastructure projects. The New Jersey Infrastructure Bank provides principal forgiveness opportunities and better financing packages for those projects that implement climate change resilience measures. Information on the program is available on the website: https://www.njib.gov/.	NJDEP	https://www.njib.gov/
Drinking Water State Revolving Fund	The DWSRF program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Infrastructure Trust funds. Additionally, the Water Supply program provides operator licensing and training support as well as financial assistance through the DWSRF program. Information on the program is available on the website: https://www.state.nj.us/dep/watersupply/dws_loans.html.	NJDEP	https://www.state.nj.us/dep/watersupply/dws_loans.html

Program	Description	Lead Agency	Website
New Jersey Department of Transportation (NJDOT) Local Aid and Economic Development	NJDOT is committed to advancing projects that enhance safety, renew the aging infrastructure and the State's economy, and support new transportation opportunities. The Transportation Trust Fund (TTF) provides the opportunity for State assistance to local governments for the funding of road, bridge, and other transportation projects. Annually, the TTF provides $400 million in State Aid to municipalities and counties for local transportation improvements. In addition, several programs which provide funding to counties and municipalities are funded with federal monies available through the Transportation Equity Act for the 21st Century (TEA 21) legislation. Information on the program is available on the website: https://www.state.nj.us/transportation/business/localaid/funding.shtm.	NJDOT	https://www.nj.gov/transportation/business/localaid/

Program	Description	Lead Agency	Website
Environmental Aid Act (N.J.S.A. 13:1H – 1 to 7) Office of Environmental Services Matching Grants Program for Local Environmental Agencies (N.J.A.C.7:5)	State aid may be granted by the department to a local environmental agency for any activity that the agency is authorized to perform by law and for the preparation of an environmental index. An environmental index shall be a report on environmental conditions within the locality and community objectives concerning open areas, parks, water supply, solid waste, wildlife protection, soil resources, air pollution, water pollution, and other related issues. The department may provide technical assistance in addition to (or in lieu of) State aid to any local environmental agency for the purpose indicated in this act. The purpose of the funding dedicated under this act is to assist local environmental commissions and soil conservation districts with funding for a variety of local environmental projects, including community education projects; environmental resource inventories; beach monitoring and management projects; environmental trail designs; lake rehabilitation studies; stream and water quality testing; wellhead delineation; GIS mapping projects; National Environmental Performance Partnership System indicator projects; and surveys of threatened and endangered species. The maximum annual grant is $2,500. Applicants must match at least 50 percent of the total cost of the project (NJDEP n.d.). Projects funded by this grant are reported online. Examples of mitigation projects that have been funded in the past include Waterways Beach Monitoring and Management Strategy, Dune Project, Beach Protection and Storm Drainage Plan, Beach Storm Water Drainage Analysis, Stream Corridor/Greenway Protection Plan, Shoreline Bioengineering Demonstration and Outreach Project, Stream, and the Pamphlet/Education Project.	NJDEP Office of Environmental Services	https://www.nj.gov/dep/rules/proposals/041306.pdf

Program	Description	Lead Agency	Website
Sewage Infrastructure Improvement Act Grants (N.J.A.C.7:22)	New Jersey Sewage Infrastructure Improvement Act establishes comprehensive requirements for NJDEP and municipalities/authorities to address combined sewer overflows and stormwater management. NJDEP issues permits and provides below-market interest rate loans through the Environmental Infrastructure Financing Program to municipalities for capital improvements that improve water quality. To prioritize wastewater projects under the Environmental Infrastructure Financing Program, projects are ranked to address higher State priorities or high-water quality problems or improvements.	NJDEP	https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_22a.pdf
Water Pollution Control Quality Act (N.J.S.A. 58:10A-1 to 60) Water Quality Management Planning Rules (N.J.A.C.7:15)	This Act phased out the Construction Grants Program and required states to establish a State Revolving Fund Loan Program. The last year in which construction grants were made available for new projects in New Jersey was 1989. Grant awards are available currently to cover increased allowable costs for projects that previously received a construction grant. The rules serve two basic functions: (1) to establish the Department's general regulatory framework for water quality planning and (2) to supplement other Department rules pertaining to wastewater management. This Act is implemented through a number of regulations and programs throughout NJDEP, including but not limited to Freshwater Wetlands Protection Act (NJAC 7:7A), Stormwater Management (NJAC 7:8), Water Pollution Control (NJAC 7:9), Surface Water Quality Standards (NJAC 7:9B), Safe Drinking Water Act (NJAC 7:10), Flood Hazard Control Act (NJAC 7:13), Pollutant Discharge Elimination System (NJAC 7:14A), and Water Quality Management (NJAC 7:15). Through these rules, NJDEP regulates development location and intensity of uses, protects floodplain capacity and riparian buffers, funds restoration of lakes and streams, and funds infrastructure improvements that primarily provide environmental health. Secondarily, the rules allow NJDEP to provide mitigation in the form of reduced losses due to infrastructure failure. Wastewater Management Plans (WMP) are integral components of area-wide Water Quality Management Plans. WMPs are the vehicle through which the continuing planning process integrates local and regional planning into the area-wide Water Quality Management Plans.	NJDEP	https://www.nj.gov/dep/landuse/download/58_10a.pdf

Program	Description	Lead Agency	Website
New Jersey Department of Environmental Protection: WRM, Municipal Finance and Construction Element New Jersey Environmental Infrastructure Financing Program (NJEIFP)	NJEIFP is a revolving loan program for the construction of drinking water facilities, wastewater treatment facilities, sludge management systems, combined sewer overflow abatement, stormwater, and other non-point source management projects. The program also offers funding to publicly and privately-owned drinking water systems for the construction or upgrade of drinking water facilities, transmission and distribution systems, storage facilities, and source development. NJEIFP also offers a disaster relief fund that will be able to provide short-term or bridge loans to entities that are in need of an upfront cash flow (NJDEP 2017).	NJDEP	https://dep.nj.gov/wp-content/uploads/wiip/ffy2023-sfy2024-final-dwsrf-iup-12-20-2023.pdf
New Jersey Turnpike Authority: Capital Program	The New Jersey Turnpike Authority (Authority) is dedicated to the safe and efficient movement of people and goods over two of the busiest toll roads in the United States – the New Jersey Turnpike (NJTP) and the Garden State Parkway (GSP). The Authority's highways are a critical link in the transportation network of the Northeast Corridor. Under the current 10-year, $7 billion capital program adopted in 2008, the Authority has expanded capacity, repaired deteriorating bridges, reconfigured entrance and exit ramps, improved maintenance yards and toll plazas, and expanded the use of technology for collecting and communicating information about roadway conditions. Under this capital program, the following projects have been advanced addressing hazard mitigation: Bridge Security Program, Forest Fire Prevention, Roadside Weather Information System (RWIS), Coastal Evacuation. Through the Asset Management Program, the Turnpike Authority invests approximately $50 million annually on drainage-related projects to better equip the Authority's roadways in response to major rainfall events.	New Jersey Turnpike Authority	https://www.nj.gov/transportation/capital/cpd/

Program	Description	Lead Agency	Website
New Jersey Department of Transportation (NJDOT): Local Aid and Economic Development	NJDOT is committed to advancing transportation projects that enhance safety, renew aging infrastructure, and support new transportation opportunities at the county and municipal level. The Transportation Trust Fund and the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFE-TEA) legislation provide the opportunity for funding assistance to local governments for road, bridge, and other transportation projects. NJDOT has established several local aid programs that provide financial support to counties and municipalities for capital improvements to transportation infrastructure.	NJDOT	https://www.nj.gov/transportation/business/localaid/
Coastal Engineering and Restoration Projects	Funding for coastal engineering and restoration projects is available from a variety of state funding sources, including: • Coastal Engineering • Coastal and Land Use Enforcement • Dam Safety • Flood Control • Land Resource Protection • Resilience Engineering and Construction • Tidelands	NJDEP	https://dep.nj.gov/wlm/drec/ce/

1.1.2 Mitigation Catalog

The table below provides a list of potential personal, corporate, and government scale mitigation actions for each of the identified natural hazards in the Sussex County HMP. Please note that this table is not intended to be a comprehensive list, but rather a starting point to help identify potential actions for participating jurisdictions. This catalog of potential actions was provided to participating jurisdictions at the Mitigation Strategy Workshop.

Table I-5. Sussex County Mitigation Catalog

DAM FAILURE		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the hazard:
  • None
• Reduce exposure to the hazard:
  • Relocate out of dam failure inundation areas.
• Reduce vulnerability to the hazard:
  • Elevate home to appropriate levels.
• Increase Capability:
  • Learn about risk reduction for the dam failure hazard.
  • Learn the evacuation routes for a dam failure event.
  • Educate yourself on early warning systems and the dissemination of warnings.
	• Manipulate the hazard:
	  • Remove dams.
	  • Harden dams.
	• Reduce exposure to the hazard:
	  • Replace earthen dams with hardened structures.
	  • Relocate facilities out of dam failure inundation areas.
	• Reduce vulnerability to the hazard:
	  • Floodproof facilities within dam failure inundation areas.
	• Increase Capability:
	  • Educate employees on the probable impacts of a dam failure.
	  • Develop a continuity of operations plan.
		• Manipulate the hazard:
		  • Remove dams.
		  • Harden dams.
		• Reduce exposure to the hazard:
		  • Replace earthen dams with hardened structures.
		  • Relocate critical facilities out of dam failure inundation areas.
		  • Consider open space land use in designated dam failure inundations areas.
		• Reduce vulnerability to the hazard:
		  • Adopt higher floodplain standards in mapped dam failure inundation areas.
		  • Retrofit critical facilities within dam failure inundation areas.
		• Increase Capability:
		  • Map dam failure inundation areas.
		  • Enhance emergency operations plans to include a dam failure component.
		  • Institute monthly communications checks with dam operators.
		  • Inform the public on risk reduction techniques.
		  • Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas.
		  • Consider the probable impacts of climate change in assessing the risk associated with the dam failure hazard.

DAM FAILURE		
Personal Scale	Corporate Scale	Government Scale
		• Establish early warning capability downstream of listed high-hazard dams. • Consider the residual risk associated with protection provided by dams in future land use decisions.

DISEASE OUTBREAK		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • Proper hygiene.
  • PPE.
  • Social distancing.
• Reduce vulnerability to the hazard:
  • Focus on personal health.
• Increase Capability:
  • Storage of PPE.
  • Storage of supplies and food to reduce need to enter public spaces.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • PPE.
	  • Social distancing.
	• Reduce vulnerability to the hazard:
	  • Distanced work environment.
	  • Regular cleaning of work environment.
	• Increase Capability:
	  • Storage of PPE.
	  • Equipment for monitoring.
	  • Trainings for staff.
		• Manipulate the Hazard:
		  • None
		• Reduce exposure to the hazard:
		  • PPE.
		  • Social distancing.
		• Reduce vulnerability to the hazard:
		  • Distanced work environment.
		  • Regular cleaning of work environment.
		• Increase Capability:
		  • Storage of PPE.
		  • Equipment for monitoring/treatment.
		  • Trainings for staff.
		  • Public outreach.

DROUGHT		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • Consider stored water/captured water techniques during dry seasons.
  • Establishing an irrigation time/scheduling program or process so that all agricultural land gets the required amount of water. Through incremental timing, each area is irrigated at different times so that all water is not consumed at the same time. Spacing usage may also help with recharge of groundwater.
• Reduce vulnerability to the hazard:
  • Drought resistant landscapes.
  • Reduce water system losses.
  • Regularly check for leaks to minimize water supply losses.
  • Install low-flow water saving showerheads and toilets.
  • Turn water flow off while brushing teeth or during other cleaning activities.
  • Adjust sprinklers to water the lawn and not the sidewalk or street.
  • Run the dishwasher and washing machine only when they are full.
  • Check for leaks in plumping or dripping faucets.
  • Install rain-capturing devices for irrigation.
  • Install graywater systems in homes to encourage water reuse.
  • Rotate crops by growing a series of different types of crops on the same fields every season to reduce soil erosion.
  • Planting “cover crops,” such as oats, wheat, and buckwheat, to prevent soil erosion.
• Increase Capability:
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • Consider stored water/captured water techniques during dry seasons.
	• Reduce vulnerability to the hazard:
	  • Drought resistant landscapes.
	  • Reduce private water system losses.
	  • Identify alternate water supply sources.
	  • Install low-flow water saving showerheads and toilets.
	  • Adjust sprinklers to water the lawn and not the sidewalk or street.
	• Increase Capability:
	  • Practice active water conservation.
	  • Develop a COOP.
	  • Create a water conservation plan.
		• Manipulate the Hazard:
		  • Ground Water Recharge through stormwater management.
		  • Implement cloud seeding techniques during dry seasons.
		• Reduce exposure to the hazard:
		  • Identify and create ground water back up sources.
		  • Create /identify new impounded water supply points.
		  • Developing new or upgrading existing water delivery systems to eliminate breaks and leaks.
		• Reduce vulnerability to the hazard:
		  • Water use conflict regulations.
		  • Reduce water system losses.
		  • Distribute water saving kits.
		  • Identify sites ideally suited for ground water recharge.
		  • Implement stormwater retention in regions ideally suited for groundwater recharges.
		  • Utilize drought resistant landscapes on community owned facilities.
		  • Encourage citizens to take water-saving measures.
		• Increase Capability:
		  • Public education on drought resistance.
		  • Identify alternative water supplies for time of drought. Mutual aid agreements with alternative suppliers.
		  • Develop a drought contingency plan.
		  • Develop criteria-"triggers" for drought related actions.
		  • Improve accuracy of water supply forecasts.
		  • Provide incentives to influence active water conservation techniques such as water user rate reductions.

DROUGHT		
Personal Scale	**Corporate Scale**	**Government Scale**
• Practice active water conservation techniques. • Seek ways to operate wells in such a way to enhance their functional longevity and supply capability.		• Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their homes. • Use of water buffalo tankers. • Promote well usage techniques that strive to enhance functional longevity and supply capability of private water supply wells. • Develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc.

EARTHQUAKE		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • Locate outside of hazard area (off soft soils).
• Reduce vulnerability to the hazard:
  • Retrofit structure (anchor house structure to foundation).
  • Secure household items that can cause injury or damage such as water heaters, bookcases, and other appliances.
  • Build to higher design standards.
• Increase Capability:
  • Practice "drop, cover and hold"
  • Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72 hr. self-sufficiency during an event.
  • Increase capability by having cash reserves for reconstruction.
  • Become informed on the hazard and risk reduction alternatives available.
  • Develop a post-disaster action plan for your household.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • Locate/relocate mission critical functions outside hazard area where possible.
	• Reduce vulnerability to the hazard:
	  • Build redundancy for critical functions/facilities.
	  • Retrofit critical buildings/areas housing mission critical functions.
	• Increase Capability:
	  • Adopt higher standard for new construction -- Consider "performance-based design' when building new structures.
	  • Increase capability by having cash reserves for reconstruction.
	  • Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility.
	  • Develop a Continuity of Operations Plan (COOP).
		• Manipulate the Hazard:
		  • None
		• Reduce exposure to the hazard:
		  • Locate critical facilities or functions outside of hazard area where possible.
		• Reduce vulnerability to the hazard:
		  • Harden infrastructure.
		  • Provide redundancy for critical functions.
		  • Adopt higher regulatory standards for structures.
		  • Conduct "rapid screening" programs for critical facilities to identify facilities that may be particularly prone to EQ damage, then develop investigation/action plans to address such structures.
		• Increase Capability:
		  • Provide better hazard maps.
		  • Provide technical information and guidance.
		  • Enact tools to help manage development in hazard areas: tax incentives, information.
		  • Include retrofitting/replacement of critical system elements in CIP.
		  • Develop strategy to take advantage of post disaster opportunities.
		  • Warehouse critical infrastructure components such as pipe, power line, and road repair material.
		  • Develop and adopt a Continuity of Operations / Continuity of Government Plan (COOP/COG).
		  • Initiate triggers guiding improvements such as: (< 50% substantial damage/improvements).
		  • Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities.

EARTHQUAKE		
Personal Scale	Corporate Scale	Government Scale
		• Develop a post disaster action plan that includes a grant funding and debris removal components. • Utilize warning systems. • Educate builders and developers on seismic construction standards.

FLOOD		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Clear stormwater drains and culverts.
• Reduce exposure to the hazard:
  • Locate or re-locate outside of hazard area.
  • Institute low impact development techniques on property.
• Reduce vulnerability to the hazard:
  • Retrofit existing structures and utilities above Base Flood Elevation (BFE).
  • Floodproof existing structures (wet- or dry floodproofing).
  • Store hazardous materials above BFE or outside of floodprone areas.
• Increase Capability:
  • Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72-hr. self-sufficiency during and after an event.
  • Buy flood insurance.
	• Manipulate the Hazard:
	  • Clear stormwater drains and culverts.
	• Reduce exposure to the hazard:
	  • Locate business critical facilities or functions outside hazard area.
	  • Institute low impact development techniques on property.
	• Reduce vulnerability to the hazard:
	  • Build redundancy for critical functions/ retrofit critical buildings.
	  • Provide flood-proofing measures when new critical infrastructure must be located in floodplains.
	  • Harden structures and infrastructure (wet and dry-floodproofing).
	  • Store hazardous materials above BFE or outside of floodprone areas.
	• Increase Capability:
	  • Increase capability by having cash reserves for reconstruction.
	  • Develop and adopt a Continuity of Operations Plan (COOP).
	  • Solicit 'cost-sharing" through partnerships with private sector stakeholders on projects with multiple benefits.
	  • Dam owner/operators should continue to be aware of and understand dam inspection and reporting requirements.
	  • Ensure that all dam EAP's are kept in compliance with State Regulations.
		• Manipulate the Hazard:
		  • Clear stormwater drains and culverts
		  • Dredging, levee construction, providing retention areas.
		  • Structural flood control: levee's, dams, channelization, revetments.
		  • Construct regional stormwater control facilities.
		  • Lead and develop a county-wide stream clearing strategy including the development of thresholds for response/action.
		• Reduce exposure to the hazard:
		  • Locate/re-locate critical facilities outside of hazard area.
		  • Acquire or relocate identified repetitive loss properties.
		  • Promote open space uses in identified high hazard areas via techniques such as: PUD's, easements, setbacks, greenways, sensitive area tracks.
		  • Adopt land development criteria such as PUD's, Density transfers, clustering.
		  • Institute low impact development techniques on property.
		  • Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff.
		  • Pass an ordinance to incorporate additional zoning classifications into flood zones within each municipality.
		  • Increase floodplain standards within municipal ordinances and include provisions for enforcing best practice standards.
		  • Consider increasing minimum freeboard beyond state requirements.

FLOOD		
Personal Scale	Corporate Scale	Government Scale

		• Continue development application reviews by County Planning Board to reduce risky development practices.
		• Reduce vulnerability to the hazard:
		  • Harden structures and infrastructure (wet and dry-floodproofing).
		  • Provide redundancy for critical functions and infrastructure.
		  • Adopt appropriate regulatory standards such as cumulative substantial improvement/damage, freeboard, lower substantial damage threshold, compensatory storage.
		  • Stormwater management regulations and master planning.
		  • Adopt "no-adverse impact" floodplain management policies that strive to not increase the flood risk on down-stream communities.
		  • Participate in the Community Rating System (CRS).
		  • Implement as-built regulatory requirements.
		  • Implement site review ordinances/requirements.
		  • Establish stream maintenance programs with stakeholders (e.g. Soil and Water Conservation District) - support county leads of such efforts.
		  • Incorporate retrofitting/replacement of critical facilities and infrastructure in Capital Improvement Plans (CIPs).
		  • Promote the use of vegetation/plants as green erosion control measures to reduce localized flooding.
		  • Work with environmental groups to address removal of debris, log jams, etc. in flood vulnerable stream sections.
		• Increase Capability:

FLOOD		
Personal Scale	Corporate Scale	Government Scale
		• Produce better hazard maps, and improve access to flood hazard mapping • Capture/survey "high-water" marks during flood events. • Provide technical information and guidance on appropriate mitigation options available to businesses and homeowners. • Enact tools to help manage development in hazard areas (stronger controls, tax incentives, information). • Establish an additional layer of zoning within flood hazard areas. • Develop strategy to take advantage of post disaster opportunities. • Improve compliance with and enforcement of the NFIP. • Develop mitigation partnerships with regional stakeholders. • Join Community Rating System (CRS) program, or improve level of participation in CRS. • Develop and implement a public information strategy for flood hazard awareness, flood insurance (NFIP) and mitigation. • Maintain existing data as well as gather new data needed to define risks and vulnerability. • Create a building and elevation inventory of structures in the floodplain • Identify flood prone areas that may be in need of new flood studies. • Establish a program to identify and educate owners of flood-prone properties of potential mitigation options (e.g. elevations, relocations). • Charge a hazard mitigation fee on all new permits to create a hazard mitigation

FLOOD		
Personal Scale	Corporate Scale	Government Scale
		funding source for initiatives or grant cost share requirements. • Integrate floodplain management policies into other planning mechanisms within the planning area. • Establish a Stormwater Utility to deal with urban drainage/flooding issues. • Establish incentives to promote flood hazard mitigation of private property (e.g. permit fee waivers). • Adopt ordinances/standards for cumulative damages and/or improvements. • Upgrade NFIP Floodplain ordinance, as well as other ordinances to current or above current state and federal standards. • Develop and adopt a COOP. • Join "Storm Ready" Program. • Participate in county and regional training programs. • Provide additional training/certification to NFIP floodplain administrators and code officials. • Implement annual training to account for turnover of municipal officials. • Maintain and enhance flood forecasting ability, including the establishment and maintenance of critical stream gages. • Explore grant funding opportunities and potential partnerships to help maintain existing gages and install additional gages to improve forecasting and flood warning ability. • Promote awareness and participation in alert systems. • Support and participate in regional flood management efforts.

FLOOD		
Personal Scale	Corporate Scale	Government Scale
		• Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones. • Provide continued and enhanced training for emergency responders. • Establish a revolving "bank" or budget line item to fund grant application support. • Continue to review updated Flood Insurance Rate Maps to ensure accuracy as well as maintaining lines of communication with homeowners to make them aware of potential changes related to their property status. • Provide trainings for FPA's on the NFIP/Floodplain Best Practices and also pursue CFM accreditation for municipal FPA's. • Build and maintain relationships to develop regional watershed/floodplain mitigation solutions. • Pursue grant funding opportunities to fund repairs of catchments and infrastructure on a proactive basis. • Explore grant funding opportunities related to climate change to fund mitigation projects.

GEOLOGICAL HAZARDS		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Apply soil stabilization measures, such as planting soil stabilizing vegetation on steep slopes.
• Reduce exposure to the hazard:
  • None
• Reduce vulnerability to the hazard:
  • None
• Increase Capability:
  • None
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • None
	• Increase Capability:
	  • None
		• Manipulate the Hazard:
		  • Implement reinforcement measures in high-risk areas.
		  • Use debris flow measures that may reduce damage in sloping areas, such as stabilization, emergency dissipation, and flow control measures.
		  • Apply soil stabilization measures, such as planting soil stabilizing vegetation on steep, publicly owned slopes.
		• Reduce exposure to the hazard:
		  • Consider hazard areas in land-use
		  • planning, zoning, and development siting.
		  • Acquire structures in highest hazard areas (demolish and convert to restricted open space).
		  • Relocation of Structures.
		  • Open Space Preservation.
		  • Create or increase setback limits on parcels near high-risk parcels.
		• Reduce vulnerability to the hazard:
		  • Consider hazard areas in land-use
		  • planning and development siting.
		  • Stabilize vulnerable slopes near
		  • structures and infrastructure.
		  • Work with stakeholders such as USGS to develop appropriate risk reduction strategies.
		  • Install catch-fall nets for rocks at steep slopes near roadways.
		• Increase Capability:
		  • Increase understanding of hazard
		  • areas (e.g. Landslide Susceptibility Maps) - geotechnical surveys, LIDAR and mapping.
		  • Assessing vegetation in wildfire-prone areas to prevent landslides after fires (e.g. encourage plants with strong root systems).

GEOLOGICAL HAZARDS		
Personal Scale	**Corporate Scale**	**Government Scale**
		• Work with stakeholders such as USGS to develop appropriate risk reduction strategies. • Support and implement hazard • disclosure for the sale/re-sale of • property in identified risk zones. • Develop county-level programs to document slide events (landslide inventory), and maintain its currency.

HAZARDOUS MATERIALS		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Identify and eliminate sources of potential hazardous material spills.
• Reduce exposure to the hazard:
  • Increase distance between hazardous material sites and development.
• Reduce vulnerability to the hazard:
  • None
• Increase Capability:
  • Personal planning for potential event.
	• Manipulate the Hazard:
	  • Identify and eliminate sources of potential hazardous material spills.
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • None
	• Increase Capability:
	  • Increase inspection of hazardous material facilities and transport vehicles.
	  • Conduct training for response.
		• Manipulate the Hazard:
		  • Identify and eliminate sources of potential hazardous material spills.
		• Reduce exposure to the hazard:
		  • Increase inspection of hazardous material facilities and transport vehicles.
		• Reduce vulnerability to the hazard:
		  • None
		• Increase Capability:
		  • Increase inspection of hazardous material facilities and transport vehicles.
		  • Conduct training for response.
		  • Public outreach.

HURRICANE		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • None
• Reduce vulnerability to the hazard:
  • Retrofit structures (improved roofing, glazing, insulation, etc.).
  • Provide for redundant heat and power.
  • Contact municipality or utilities to trim or remove trees that could affect power lines.
  • Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program.
• Increase Capability:
  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
  • Promote 72-hour self-sufficiency.
  • Provide for redundant heat and power.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • Relocate critical infrastructure, such as power lines, underground
	  • Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations.
	• Increase Capability:
	  • Contact municipality or utilities to trim or remove trees that could affect power lines.
	  • Create redundancy (e.g. backup generators).
	  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
	  • Develop a Continuity of Operations Plan (COOP).
	  • Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.
		• Manipulate the Hazard:
		• None
		• Reduce exposure to the hazard:
		• None
		• Reduce vulnerability to the hazard:
		• Harden infrastructure such as locating utilities underground.
		• Trimming trees back from power lines.
		• Designate and strengthen critical road sections and bridges.
		• Adopt ordinances that regulate the type and quantity of trees planted near utility lines.
		• Relocate critical infrastructure, such as power lines, underground.
		• Require minimum temperatures in housing/landlord codes.
		• Increase Capability:
		  • Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
		  • Enforce building codes.
		  • Increase communication alternatives.
		  • Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
		  • Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines.
		  • Promote awareness and participation in alert systems.
		  • Provide NOAA weather radios to the public.
		  • Create/Enhance "mutual aid" agreements for response to all emergencies.
		  • Create/identify evacuation routes to be utilized during severe storm events.
		  • Develop debris management plans.

HURRICANE		
Personal Scale	Corporate Scale	Government Scale
		• Join "Storm-Ready" program. • Provide early warning of impending hurricane events to identified critical or essential facilities. This would include facilities such as large employments centers, schools, hospitals. • Promote emergency power supplies to private property. • Improve, expand, or harden communications facilities and services. • Recruit additional emergency personnel or use mutual aid agreements. • Increase sheltering capabilities. • Increase capability to respond to power outages and downed power lines. • Establish partnerships with utility providers through pro-active planning.

INFESTATION		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Participate in quarantine, control, or eradication programs.
• Reduce exposure to the hazard:
  • Comply with harmful algal bloom rules and regulations to minimize the exposure to HAB.
• Reduce vulnerability to the hazard:
  • Form citizen action groups to promote awareness and best practices on local levels.
• Increase Capability:
  • Regularly check the NJ DEP HAB and Invasive Species information page for updated information.
  • Comply with Invasive Species rules and regulations to minimize the chance for invasive species to spread.
  • Broaden collaborations focused
  • on ecosystem restoration and
  • ecosystem-based management.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • None
	• Increase Capability:
	  • Build and maintain partnerships with government agencies, academia, and stakeholders to coordinate information sharing, and response for Invasive Species and Harmful Algal Blooms throughout the county/region.
		• Manipulate the Hazard:
		  • Work with Federal/State agencies on quarantine, control, or eradication programs for invasive species.
		• Reduce exposure to the hazard:
		  • Create/disseminate planting guides which explain which types of plants and vegetation are safe to plant within the county.
		• Reduce vulnerability to the hazard:
		  • Pass municipal ordinances to enforce best practices for invasive species at the local level.
		• Increase Capability:
		  • Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region.
		  • Work with federal/state agencies to disseminate information to local municipalities regarding Invasive Species from the NJ DEP and US EPA.
		  • Disseminate information to the general public to educate them on Invasive Species.
		  • Work with stakeholders to identify and expand resources for prevention and early detection of invasive species.
		  • Broaden collaborations focused on ecosystem restoration and ecosystem-based management.
		  • Build ecological restoration planning into IS management projects.

NOR'EASTER		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • None
• Reduce vulnerability to the hazard:
  • Retrofit structures (improved roofing, glazing, insulation, etc.).
  • Provide for redundant heat and power.
  • Contact municipality or utilities to trim or remove trees that could affect power lines.
  • Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program.
• Increase Capability:
  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
  • Promote 72-hour self-sufficiency.
  • Provide for redundant heat and power.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • Relocate critical infrastructure, such as power lines, underground.
	  • Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations.
	• Increase Capability:
	  • Contact municipality or utilities to trim or remove trees that could affect power lines.
	  • Create redundancy (e.g. backup generators).
	  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
	  • Develop a Continuity of Operations Plan (COOP).
	  • Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.
		• Manipulate the Hazard:
		  • None
		• Reduce exposure to the hazard:
		  • None
		• Reduce vulnerability to the hazard:
		  • Harden infrastructure such as locating utilities underground.
		  • Trimming trees back from power lines.
		  • Designate and strengthen critical road sections and bridges.
		  • Adopt ordinances that regulate the type and quantity of trees planted near utility lines.
		  • Relocate critical infrastructure, such as power lines, underground.
		• Increase Capability:
		  • Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
		  • Enforce building codes.
		  • Increase communication alternatives.
		  • Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
		  • Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines.
		  • Promote awareness and participation in alert systems.
		  • Provide NOAA weather radios to the public.
		  • Create/Enhance "mutual aid" agreements for response to all emergencies.
		  • Create/identify evacuation routes to be utilized during severe storm events.
		  • Develop debris management plans.
		  • Join "Storm-Ready" program.

NOR'EASTER		
Personal Scale	Corporate Scale	Government Scale
		• Provide early warning of impending nor'easter events to identified critical or essential facilities. This would include facilities such as large employments centers, schools, hospitals. • Promote emergency power supplies to private property. • Improve, expand, or harden communications facilities and services. • Recruit additional emergency personnel or use mutual aid agreements. • Increase sheltering capabilities. • Increase capability to respond to power outages and downed power lines. • Establish partnerships with utility providers through pro-active planning.

SEVERE WEATHER		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Increase tree plantings.
  • Installation of green roofs to provide shade and remove heat.
  • Use cool roofing products that reflect sunlight and heat away from a building.
• Reduce exposure to the hazard:
  • None
• Reduce vulnerability to the hazard:
  • Retrofit structures (improved roofing, glazing, insulation, etc.).
  • Provide for redundant heat and power.
  • Contact municipality or utilities to trim or remove trees that could affect power lines.
  • Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program.
  • Retrofit pipes including locating water pipes on the inside of building insulation or keeping them out of vulnerable spaces to extreme cold.
• Increase Capability:
  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
  • Promote 72-hour self-sufficiency.
  • Provide for redundant heat and power.
	• Manipulate the Hazard:
	  • Increase tree plantings.
	  • Installation of green roofs to provide shade and remove heat.
	  • Use cool roofing products that reflect sunlight and heat away from a building.
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • Relocate critical infrastructure, such as power lines, underground.
	  • Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations.
	  • Retrofit pipes including locating water pipes on the inside of building insulation or keeping them out of vulnerable spaces to extreme cold.
	• Increase Capability:
	  • Contact municipality or utilities to trim or remove trees that could affect power lines.
	  • Create redundancy (e.g. backup generators).
	  • Improve awareness of impending severe weather (e.g. obtain a NOAA weather radio).
	  • Develop a Continuity of Operations Plan (COOP).
	  • Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.
	  • Set rules restricting outdoor work during extreme temperature events.
		• Manipulate the Hazard:
		  • Increase tree plantings.
		  • Encourage installation of green roofs to provide shade and remove heat.
		  • Encourage the use of cool roofing products that reflect sunlight and heat away from a building.
		• Reduce exposure to the hazard:
		  • None
		• Reduce vulnerability to the hazard:
		  • Harden infrastructure such as locating utilities underground.
		  • Trimming trees back from power lines.
		  • Designate and strengthen critical road sections and bridges.
		  • Adopt ordinances that regulate the type and quantity of trees planted near utility lines.
		  • Relocate critical infrastructure, such as power lines, underground.
		  • Require minimum temperatures in housing/landlord codes.
		• Increase Capability:
		  • Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
		  • Enforce building codes.
		  • Increase communication alternatives.
		  • Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
		  • Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines.
		  • Promote awareness and participation in alert systems.
		  • Provide NOAA weather radios to the public.

SEVERE WEATHER		
Personal Scale	**Corporate Scale**	**Government Scale**
		• Create/Enhance "mutual aid" agreements for response to all emergencies. • Create/identify evacuation routes to be utilized during severe storm events. • Develop debris management plans. • Join "Storm-Ready" program. • Provide early warning of impending severe storm events to identified critical or essential facilities. This would include facilities such as large employments centers, schools, hospitals. • Promote emergency power supplies to private property. • Improve, expand, or harden communications facilities and services. • Recruit additional emergency personnel or use mutual aid agreements. • Increase sheltering capabilities. • Increase capability to respond to power outages and downed power lines. Establish partnerships with utility providers through pro-active planning. • Educate citizens regarding the dangers of extreme heat and cold and the steps they can take to protect themselves when extreme temperatures occur. • Establish warming and cooling centers. • Establish extreme temperature planning in emergency operation plans. • Create a database to track those individuals at high risk of death such as the elderly, homeless, etc.

SEVERE WINTER WEATHER		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • None
• Reduce exposure to the hazard:
  • Plant appropriate trees near home and power lines (“Right tree, right place” National Arbor Day Foundation).
• Reduce vulnerability to the hazard:
  • Insulate House to provide greater thermal efficiency and reduce heat loss.
  • Provide redundant heat and power.
• Insulate Structure.
  • Ensure natural gas input/release valves do not get covered in snow.
  • Increase Capability:
  • Trim or remove trees that could affect power lines.
  • Prepare emergency food and supplies to be self-sufficient for at least 72 hours in the event of a severe winter storm.
  • Be aware of inclement weather conditions and move your vehicles off the street as severe weather systems approach.
  • Retrofit structures.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • Relocate critical infrastructure, such as power lines, underground.
	  • Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations.
	  • Install tree wire.
	• Increase Capability:
	  • Trim or remove trees that could affect power lines.
	  • Create redundancy in utilities and communications.
	  • Develop a Continuity of Operations Plan (COOP) to address operations before, during and after coastal storm events.
	  • Utilize weather radios at the work place to keep your employees aware of severe weather conditions.
		• Manipulate the Hazard:
		  • None
		• Reduce exposure to the hazard:
		  • None
		• Reduce vulnerability to the hazard:
		  • Harden infrastructure such as locating utilities underground where appropriate.
		  • Trimming trees back from power lines.
		  • Designate snow routes and strengthen critical road sections and bridges.
		  • Adopt codes and regulations that address the issues of parking of vehicles along roadways during severe weather events.
		  • Develop or enhance the capacity/capability of stormwater conveyance systems.
		  • Provide backup power sources at vital critical facilities.
		• Increase Capability:
		  • Support programs that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
		  • Establish and enforce building codes that require all roofs to withstand snow loads--Develop/Improve/Enforce building Codes in Hazard Areas.
		  • Increase communication alternatives.
		  • Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
		  • Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines.
		  • Provide weather radios to vulnerable populations.
		  • Enhance public awareness campaigns to address those issues of alert and warning

SEVERE WINTER WEATHER		
Personal Scale	**Corporate Scale**	**Government Scale**
		and actions to take during severe weather events. • Utilize the best available technology to enhance the warning systems for all severe weather events (i.e.: tornado warning systems). • Coordinate severe weather warning capabilities and the dissemination of warning amongst those agencies within the planning are with the highest degree of capability. • Encourage local ordinances for planting tree near lines and join Tree City USA. • Increase tree management programs. • Join the Community Rating System. • Join "Storm-Ready". • Retrofit critical structures and promote hazard resistant construction. • Keep open communications and education of hazards for mobile home communities. • Retrofit above-ground utilities to underground facilities if appropriate. • Create a salt reserve or research alternates to stretch salt reserve. • Ensure accessibility to hospitals. • Provide better debris logistics and removal. • Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.

WILDFIRE		
Personal Scale	**Corporate Scale**	**Government Scale**

• Manipulate the Hazard:
  • Clear potential fuels on property; dry, overgrown underbrush; diseased trees.
• Reduce exposure to the hazard:
  • Clean and maintain defensible space around structures.
  • Locate outside hazard area.
  • Mow regularly.
• Reduce vulnerability to the hazard:
  • Create and maintain defensible space around structures, provide water on site.
  • Use fire-retardant building materials.
  • Create defensible spaces around your home.
• Increase Capability:
  • Employ Firewise techniques to safeguard your home.
  • Identify alternative water supply points proximate to your home such as swimming pools, lakes, streams.
  • Support your local fire department.
  • Be aware of weather conditions that support/enhance the probability of wildfires.
	• Manipulate the Hazard:
	  • None
	• Reduce exposure to the hazard:
	  • None
	• Reduce vulnerability to the hazard:
	  • Create and maintain defensible space around structure and infrastructure and provide water onsite.
	  • Use fire-retardant building materials.
	  • Provide stored water to be utilized for firefighting with appropriate fire department connections at facilities not equipped with fire hydrants or inadequate fire hydrant spacing.
	• Increase Capability:
	  • Support Firewise community initiatives.
		• Manipulate the Hazard:
		  • None
		• Reduce exposure to the hazard:
		  • Clear fuels (dry underbrush, diseased trees) on land that can trigger and maintain wildfires.
		  • Implement Best Management Practices on public lands.
		• Reduce vulnerability to the hazard:
		  • Create and maintain defensible space around structure and infrastructure.
		  • Higher regulatory standards.
		  • Establish water main supply and hydrants in unhydranted areas.
		  • Decrease hydrant spacing.
		• Increase Capability:
		  • More public outreach and education efforts including an active “Firewise” program.
		  • Identify fire response and alternative evacuation routes.
		  • Seek alternative water supplies in urban wildland interface areas.
		  • Become a "Firewise" community.
		  • Increase capability to fight wildfires utilizing equipment that can support wildfire fighting such as: tankers, engines with "pump-and-run" capabilities, dump tanks for tanker shuttle operations.
		  • Develop/implement wildfire management plans.
		  • Establish Mutual Aid Agreements with the Tender Task Force
		  • Develop a Water Supply Plan.